



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,184	07/15/2003	Mitsuru Ozono	35857	8698

116 7590 12/13/2006

PEARNE & GORDON LLP  
1801 EAST 9TH STREET  
SUITE 1200  
CLEVELAND, OH 44114-3108

EXAMINER

OSELE, MARK A

ART UNIT PAPER NUMBER

1734

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/620,184

Applicant(s)

OZONO ET AL.

Examiner

Mark A. Osele

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 07312006
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,709,543 (Kurosawa). Kurosawa shows a method and apparatus for picking up a semiconductor chip adhered to a sheet by using a pick up head comprising: a sheet exfoliating step for abutting a suction surface of a sheet exfoliation mechanism, 24a, 24b, 24c, against a lower surface of the sheet, 22, and for performing vacuum-sucking through the suction surface thereby to exfoliate the sheet from the semiconductor chip, 1 (See Fig. 16); and a sucking and holding step of sucking and holding an upper surface of the semiconductor chip from the sheet by the pick-up head, 10, to pick up the semiconductor chip (column 13, lines 45-50), wherein in the sheet exfoliating step, the semiconductor chip, 1, adhered to the sheet, 22, is bent and deformed by a vacuum suction force in a continuous bent range from an outer peripheral portion of one side of the chip to an outer peripheral portion of another side of the chip to exfoliate the sheet from a lower surface of the semiconductor chip (See Figs. 19A, 20A, 21A; column 17, lines 13-27, 35-45).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication 2001-118862 (Akira) in view of U.S. Patent 6,709,543 (Kurosawa). Akira shows a method and apparatus for picking up a semiconductor chip, 3a, adhered to a sheet, 1, by using a pick up head, 4a, the apparatus comprising: a holding table for holding the sheet, 1, a sheet exfoliation mechanism, 8a, with a suction surface includes a plurality of grooves, 7a, and a boundary portion which partitions the adjacent grooves wherein the boundary portions are abutted against a lower surface of the sheet, 1, and support the sheet during vacuum-sucking through the suction surface to exfoliate the sheet from the semiconductor chip, 3a (See Fig. 3). Akira fails to show the semiconductor chip to be bent.

Kurosawa teaches that it has become desirable to make semiconductor chips thin in order to fit into thin packages (column 2, lines 6-10) and that thin semiconductor chips are deformed together with the adhesive sheet when suction is applied to the sheet to exfoliate the sheet from the chip (column 2, lines 17-22, 30-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use thin semiconductor chips in the apparatus of Akira because Kurosawa teaches the demands of industry for thin chips. Furthermore, the thin chips of the references as

combined would be deformed along with the adhesive sheet during the exfoliation vacuum-sucking step of Akira as shown by Kurosawa.

Kurosawa also shows the conventional arrangement of a sheet exfoliation mechanism located beneath a sheet holding table and moving the sheet exfoliation mechanism upward to abut against the adhesive sheet (Figs. 18A, 19A, 20A). It would have been obvious to one of ordinary skill in the art at the time the invention was made to locate the sheet exfoliation mechanism of Akira beneath the sheet holding table because this conventional arrangement allows for movement of all portions of the sheet over the exfoliation mechanism to exfoliate all of the chips from the adhesive sheet.

Regarding claims 7 and 8, the semiconductor chip of the references as combined is rectangular and corner portions of the chip are not positioned directly above the boundary portions.

Regarding claim 9, Kurosawa further shows a plurality of different exfoliating tools for different types of semiconductor chips. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the exfoliating tools of the references as combined freely interchangeable on the exfoliation mechanism to make the apparatus flexible as different chips or adhesive sheets are used without requiring a completely different apparatus for each type of chip.

### ***Response to Arguments***

5. Applicant's arguments filed September 18, 2006 have been fully considered but they are not persuasive. Applicants' arguments can be categorized by two main points:

the semiconductor chip of Kurosawa is bent by thrust pins, not vacuum suction; and Kurosawa does not show a suction surface abutting the adhesive sheet.

Regarding the first point, a review of Figs. 18A-21A of Kurosawa shows the deflection stages of the semiconductor chip. In Fig. 18A the chip is flat. In Fig. 19A thrust pins push the outer edges of the chip upward while vacuum pulls the center of the adhesive tape and the center of the chip downward. If no vacuum forces were effecting the chip at this point, the chip would remain flat due to its inherent rigidity and only adhered to the adhesive tape where the chip contacts the thrust pins 24a. All other areas of the chip would be delaminated from the adhesive tape as the flexible tape would be drawn downward by vacuum away from the back surface of the chip. Similarly, in Fig. 20A, the chip would remain in the same imaginary orientation described above, flat in a plane contacting the highest thrust pins, 24a, only while separated from the tape, being pulled downward at all other locations, including at the lower oriented thrust pin, 24c. If vacuum were not effecting the shape of the semiconductor chip, there would only be two figures, Fig. 18A and Fig. 21A; the intermediate stages of Fig. 19A and Fig. 20A would not occur.

Regarding the second point, applicants dispute the examiner's characterization of the thrust pins of Kurosawa as being a suction surface. It is the examiner's position that the surface of the elements touching the adhesive tape around which vacuum is drawn would be the suction surface. The examiner cannot see any discernible difference between the suction surfaces such as Fig. 20A or Fig. 22 of Kurosawa when compared with Fig. 6A or Fig. 8A of the instant application. In both cases a series of

widely spaced apart narrow points are brought into contact with the rear surface of the adhesive sheet and vacuum is generated to pull the adhesive sheet into the wide valleys between the spaced high points.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Osele whose telephone number is 571-272-1235. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MARK A. OSELE  
PRIMARY EXAMINER

December 10, 2006